2.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

This section is based on the *I-5 HOV Lane Extension PA/ED Traffic Study* (May 2010) and discusses the impacts of the proposed project on traffic and circulation as well as pedestrian and bicycle facilities during construction (temporary impacts) and after completion of the proposed project/design year (long-term impacts [2040]) in the Cities of San Clemente, Dana Point, and San Juan Capistrano within the study area.

2.5.1 Regulatory Setting

The Department, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

The Department is committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

2.5.2 Affected Environment

2.5.2.1 Existing Roadway System

I-5 is a major north-south corridor connecting San Diego County in the south to Los Angeles County to the north. It traverses many cities, including cities in Orange County. Within the project limits, I-5 is four lanes in each direction from Avenida Pico to Camino Las Ramblas/Pacific Coast Highway (PCH; SR-1) and five lanes in each direction from just north of Camino Las Ramblas/PCH to San Juan Creek Road. Auxiliary lanes exist between Avenida Pico and Avenida Vista Hermosa, and from Camino de Estrella to Camino Las Ramblas/PCH.

The study area for the traffic analysis for the proposed project includes the freeway mainline as described above (both HOV and general-purpose lanes), ramp termini (merging, diverging, and weaving), and intersections on the local street system (ramp

intersections and those immediately adjacent). The existing roadway configuration and traffic conditions on I-5 are described in Section 1.1.1 of this IS/EA and are summarized in this subsection.

There are no on-street parking spaces or bicycle facilities within the project limits on the I-5 mainline. No other modes of transportation exist or are proposed in the near future on the freeway mainline within the project limits.

Traffic volume is usually discussed in terms of average daily traffic (ADT) and/or intersection capacity utilization (ICU). The ability of a highway to accommodate traffic is typically measured in terms of LOS. LOS is based on the ratio of traffic volume to the design capacity of the facility. LOS is expressed as a range from LOS A (free traffic flow with low volumes and high speeds, resulting in low densities) to LOS F (traffic volumes that exceed capacity and result in forced-flow operations at low speeds, resulting in high densities). Pictorial representations of the six LOS for two-lane (existing and no build conditions) and multilane (proposed project) highways based on the 2000 *Highway Capacity Manual* are provided in Chapter 1 (See Table 1.2-1).

2.5.2.2 Traffic Conditions at Mainline and Interchanges

Within the project limits, the existing (2009) ADT and peak-hour volumes on I-5 range from 5,820 to 8,130 vehicles in the northbound direction and from 5,620 to 8,870 vehicles in the southbound direction. Truck traffic is estimated to be 4 percent of the total traffic in this segment, based on the 2007 Department *Truck Traffic Report*.[1]

As shown in Table 2.5-1, the mainline within the project limits generally exceeds the Department desired operating condition of LOS C for most segments. Several segments in both the northbound and southbound directions operate at LOS D. Within the project limits, the a.m. peak hour is more congested on northbound I-5, and the p.m. peak hour is more congested on southbound I-5.

As shown in Table 2.5-2, in 2040, with the No Build Alternative, traffic will operate at LOS D or F during the a.m. and p.m. peak hours, except on northbound I-5 south of Avenida Pico and northbound I-5 south of PCH/Camino Las Ramblas in the p.m. peak hour and southbound I-5 south of Avenida Pico and southbound I-5 south of

[1] http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm

Table 2.5-1 Existing Condition (2009) Mainline LOS

Location	Direction	HOV Lane	AM Peak Hour			PM Peak Hour		
			Volume	HOV Volume	LOS	Volume	HOV Volume	LOS
Mainline south of Avenida Pico	Northbound	No	6,170	N/A	C	6,030	N/A	C
	Southbound	No	5,620	N/A	B	6,820	N/A	C
Mainline south of Avenida Vista Hermosa	Northbound	No	6,480	N/A	C	6,640	N/A	C
	Southbound	No	6,070	N/A	C	7,050	N/A	C
Mainline south of Camino de Los Mares/Camino de Estrella	Northbound	No	7,270	N/A	D	7,130	N/A	D
	Southbound	No	6,510	N/A	D	7,860	N/A	E
Mainline south of PCH/Camino Las Ramblas	Northbound	No	8,060	N/A	C	7,700	N/A	C
	Southbound	No	6,770	N/A	C	8,760	N/A	D
Mainline south of Camino Capistrano/Stonehill Drive	Northbound	Yes	6,620	1,000	D	5,820	800	C
	Southbound	No	6,520	N/A	B	8,870	N/A	C
Mainline south of South San Juan Creek Road	Northbound	Yes	8,130	1,000	E	6,860	800	D
	Southbound	No	6,520	N/A	C	8,870	N/A	D

Source: *I-5 HOV Lane Extension PA/ED Traffic Study*, May 2010.
HOV = high-occupancy vehicle
I-5 = Interstate 5
LOS = level of service
N/A = not applicable
PA/ED = Project Approval/Environmental Document
PCH = Pacific Coast Highway
SR-1 = State Route 1

Table 2.5-2 Future No Build Condition (2040) Mainline LOS

Location	Direction	HOV Lane	AM Peak Hour			PM Peak Hour		
			Volume	HOV Volume	LOS	Volume	HOV Volume	LOS
Mainline south of Avenida Pico	Northbound	No	8,120	N/A	D	7,410	N/A	C
	Southbound	No	7,690	N/A	C	9,220	N/A	D
Mainline south of Avenida Vista Hermosa	Northbound	No	8,570	N/A	D	8,090	N/A	D
	Southbound	No	8,200	N/A	D	9,360	N/A	D
Mainline south of Camino de Los Mares/Camino de Estrella	Northbound	No	9,760	N/A	F	8,840	N/A	F
	Southbound	No	8,980	N/A	F	10,620	N/A	F
Mainline south of PCH/Camino Las Ramblas	Northbound	No	11,140	N/A	D	9,170	N/A	C
	Southbound	No	9,220	N/A	D	11,340	N/A	F
Mainline south of Camino Capistrano/ Stonehill Drive	Northbound	Yes	9,390	1,150	F	7,210	960	D
	Southbound	No	8,640	N/A	C	11,050	N/A	D
Mainline south of South San Juan Creek Road	Northbound	Yes	10,920	1,150	F	8,890	960	F
	Southbound	No	8,640	N/A	D	11,050	N/A	F

Source: *I-5 HOV Lane Extension PA/ED Traffic Study*, May 2010.
HOV = high-occupancy vehicle
I-5 = Interstate 5
LOS = level of service
N/A = not applicable
PA/ED = Project Approval/Environmental Document
PCH = Pacific Coast Highway
SR-1 = State Route 1

Camino Capistrano/Stonehill Drive in the a.m. peak hour. These segments are projected to operate at LOS C. Traffic demand will exceed capacity and speeds will vary greatly, resulting in substantial delays.

2.5.2.3 Ramp Capacities

Based on existing traffic conditions and the *Caltrans Highway Design Manual* (HDM), the average capacity of single-lane on- and off-ramps without an auxiliary lane is approximately 1,500 vehicles per hour. However, for a metered single-lane on-ramp, the average capacity is approximately 900 vehicles per hour. The estimated capacity of a metered lane with an HOV bypass lane is estimated to be 1,080 vehicles per hour. All on- and off-ramps that tie into the freeway mainline within the project limits were modeled for their capacities against their existing volumes. Existing southbound I-5 ramp volumes range from 90 to 1,420 vehicles per hour, and existing northbound I-5 ramp volumes range from 60 to 1,630 vehicles per hour.

2.5.2.4 Accident Rates

The Department's Traffic Accident Surveillance and Analysis System (TASAS) provided detailed accident rates for all highways in the State. District 12 provided accident data for northbound and southbound I-5 between the Avenida Palizada interchange area and the San Juan Creek Road interchange area for the period of January 1, 2006 through December 31, 2008. The TASAS summary accident data are provided in the *Traffic Report* (May 2010).

During the 3-year period from January 1, 2006, through December 31, 2008, there were 1,188 accidents within the project limits, of which three were fatal and 374 involved injury. Multiple segments of the I-5 mainline within the project limits have a higher accident rate than the statewide average for fatal accidents, fatal plus injury accidents, and total accidents.

The following two locations on northbound I-5 experienced a fatal accident within the 36-month period:

- Between Avenida Palizada and Avenida Pico (PM 3.38)
- Between Avenida Pico and Avenida Vista Hermosa (PM 3.63)

There were two fatalities reported on this section of I-5 during the reported three-year period. The first fatality was an accident involving a single vehicle that occurred at post mile 3.38 on Friday, June 26, 2008, at 5:45 a.m. Improper turn was the primary collision factor with cloudy weather, dry pavement, and no unusual road conditions.

The object struck was the end of a metal beam guardrail located off the right shoulder. The second fatality was a two-vehicle accident that occurred at post mile 3.63 on Saturday, January 25, 2008, at 10:12 p.m. Speeding was the primary collision factor with clear weather, dry pavement, and no unusual road conditions. There are a total of 30 on- off-ramps within the study area. Of these ramps, 14 have an accident rate greater than the statewide average in at least one of the three categories (fatal accidents, fatal plus injury accidents, and total accidents). None of the ramp locations experienced a fatal accident within the three-year period.

It is anticipated that the proposed project would reduce congestion-related accidents on the NB mainline as a result of the proposed capacity increase with the addition of the HOV lane. The mainline profile will also be raised in the Avenida Pico interchange area which will improve the stopping sight distance on the sag vertical curve, also enhancing safety on I-5.

2.5.2.5 Pedestrian and Bicycle Facilities

Pedestrian and bicycle facilities within the project limits are located at the Camino de Estrella and Avenida Vista Hermosa overcrossing as well as at the Avenida Pico undercrossing. At Camino de Estrella, a sidewalk between eight and nine ft in width is provided on both sides. A Class II bikeway (on-road striped) is provided at the Avenida Vaquero undercrossing, and on the eastbound side of Avenida Vista Hermosa a sidewalk 5.5 ft in width and a Class II bicycle lane are provided on both sides. At Avenida Pico, a sidewalk between eight and 10 ft in width and a Class III bicycle facility is provided on the eastbound side.

2.5.3 Environmental Consequences

2.5.3.1 Temporary Impacts

Alternative 1 – No Build Alternative

The No Build Alternative does not include a construction component and would retain the existing roadway. The No Build Alternative would not result in temporary indirect or direct impacts to traffic volumes or circulation.

Build Alternatives 2 and 4 – Design Options A and B

Temporary construction impacts related to the Build Alternatives would occur; however, all improvements, with the exception of the I-5/Avenida Pico interchange, would be accommodated within the existing ROW to the extent feasible. Under both Design Options A and B, continuous, uninterrupted access to I-5 throughout the duration of construction would be provided. Ramp closures may occur during the

reconstruction of the I-5/Avenida Pico interchange. However, these closures would likely be limited to weekends and would not exceed a period of one week. Pedestrian and bicycle access along the Avenida Pico undercrossing would be maintained.

The Build Alternatives, with both design options, would involve replacing the I-5/ Avenida Pico undercrossing. Temporary traffic detour routes on I-5 would be necessary while falsework is being erected for the construction of the new bridge. Throughout the duration of construction, the proposed construction sequencing is intended to provide continuous, uninterrupted access to I-5. Four lanes of traffic will be maintained in both the NB and SB directions along I-5 and at least one lane will be maintained on all ramps.

Due to the temporary nature of the project construction activities affecting traffic and circulation, and the fact that the standard project requirements would be followed to minimize impacts, the proposed project would not result in temporary indirect or direct adverse effects. The required TMP prepared prior to project construction (see Chapter 1 for details) would address traffic detours during construction. This TMP would also avoid and minimize construction-related traffic and circulation impacts of the proposed project.

2.5.3.2 Permanent Impacts

Alternative 1 – No Build Alternative

Based on the information contained in the *Traffic Report*, and as shown in Table 2.5-2, the No Build Alternative would not meet the purpose and need to relieve congestion and reduce delay in 2040 and would result in indirect and direct impacts to traffic and transportation.

Table 2.5-2 shows that for the mainline, the peak-hour traffic volume would increase from a range of 5,820 to 8,130 vehicles in the northbound direction and 5,620 to 8,870 vehicles in the southbound direction for 2009 to a projected range of 7,210 to 11,140 vehicles in the northbound direction and 7,690 to 11,340 vehicles in the southbound direction for 2040. The table also shows that the mainline would operate at LOS ranging from mostly D to F (with three exceptions of LOS C) in 2040. Traffic demand will exceed capacity and speeds will vary greatly, resulting in substantial delays.

Build Alternatives 2 and 4 – Design Options A and B

Traffic congestion through the project limits is expected to decrease in 2040 with the implementation of both the Build Alternatives under both design options. As shown

in Table 2.5-3 and in the *Traffic Report*, the Build Alternatives would meet the purpose and need to relieve congestion and reduce delay. Table 2.5-3 shows that for the mainline, the LOS would range from C to F in 2040. It is anticipated that traffic delays and congestion can be reduced. However, due to the substantial increase in forecast traffic demand, as evidenced by the areas that would experience LOS E and F, traffic congestion will be experienced in some areas within the project limits even with implementation of the proposed project. This is due to a reduced number of mainline general purpose lanes in the Build Alternatives compared to the No Build Alternative. The projected traffic volumes demonstrate the anticipated increase in demand for the HOV lane if it is extended.

Table 2.5-3 Future Build Condition (2040) Mainline LOS

Location	Direction	HOV Lane	AM Peak Hour			PM Peak Hour		
			Mainline		HOV	Mainline		HOV
			Volume	LOS	Volume	Volume	LOS	Volume
Mainline south of Avenida Pico	Northbound	No	8,180	D	N/A	7,440	C	N/A
	Southbound	No	7,700	C	N/A	9,270	D	N/A
Mainline south of Avenida Vista Hermosa	Northbound	Yes	7,640	C	1,010	7,420	C	720
	Southbound	Yes	7,510	D	720	8,030	D	1,400
Mainline south of Camino de Los Mares/Camino de Estrella	Northbound	Yes	8,750	F	1,010	8,090	E	820
	Southbound	Yes	8,060	E	970	9,210	F	1,500
Mainline south of PCH/Camino Las Ramblas	Northbound	Yes	10,090	E	1,140	8,350	D	870
	Southbound	Yes	8,090	D	1,180	9,870	E	1,580
Mainline south of Camino Capistrano/Stonehill Drive	Northbound	Yes	9,340	F	1,270	7,180	D	1,020
	Southbound	Yes	7,300	C	1,370	9,480	E	1,680
Mainline south of South San Juan Creek Road	Northbound	Yes	10,860	F	1,270	8,850	F	1,020
	Southbound	Yes	7,300	D	1,370	9,480	F	1,680

Source: *I-5 HOV Lane Extension PA/ED Traffic Study*, May 2010.
HOV = high-occupancy vehicle
I-5 = Interstate 5
LOS = level of service
N/A = not applicable
PA/ED = Project Approval/Environmental Documentation
PCH = Pacific Coast Highway

With implementation of the Build Alternatives, in the northbound a.m. peak period three mainline segments within the project limits are expected to operate at LOS F and one segment is projected to operate at LOS E. In the southbound a.m. peak period, one segment is expected to operate at LOS E.

In the northbound p.m. peak period, one segment of the mainline is expected to operate at LOS E and one at LOS F. In the southbound p.m. peak period, two segments are expected to operate at LOS E and two segments are expected to operate at LOS F.

When the LOS for both Build Alternatives is compared to the 2040 No Build Alternative LOS, in the northbound direction, one freeway segment on I-5 would be improved from LOS F to LOS E in the p.m. peak hour and one segment would be improved from LOS D to C in the a.m. peak period. The LOS for three segments would remain the same in both the a.m. and p.m. peak periods. In the southbound direction, two segments (one in the a.m. peak period and one in the p.m. peak period) would improve from LOS F to E, and one segment in the a.m. peak period would improve from LOS D to C. The LOS for three segments would remain the same in the a.m. peak period and four segments would remain the same in the p.m. peak period.

The extension of the HOV lane under both Build Alternatives would result in better flow of traffic and therefore would not result in any adverse indirect or direct impacts. Only two segments in the southbound direction would exceed the recommended volume for free-flowing traffic (LOS C or better). These segments are south of Camino Capistrano/Stonehill Drive and south of San Juan Creek Road.

Additionally, the Build Alternatives, when compared to the No Build Alternative, would decrease the vehicle hours traveled (VHT) on the mainline within the project limits by 1,036 in the a.m. peak hour and by 224 in the p.m. peak hour.

The proposed project is compatible with the Circulation Elements of the City of San Juan Capistrano General Plan, the City of Dana Point General Plan, and the City of San Clemente General Plan, and the Transportation Element of the Orange County General Plan.

Pedestrian and Bicycle Facilities

Compared to the No Build Alternative, both Build Alternatives would improve pedestrian and bicycle access on Avenida Pico, and therefore would not result in any indirect or direct impacts. Bicycle lanes would be provided in both the eastbound and westbound directions and a sidewalk would be provided through the interchange in the eastbound direction only. In the westbound direction, space would be provided to accommodate future construction of a 12 ft lane and sidewalk through the interchange.

2.5.4 Avoidance, Minimization, and/or Mitigation Measures

Construction of either of the Build Alternatives would provide overall positive impacts (i.e., reduce congestion and traffic delay) along I-5 within the project limits. The addition of the HOV lane would increase the capacity of the freeway for HOVs, and as a result, reduce mainline congestion and freeway travel time.

Due to temporary ramp closures at Avenida Pico, pedestrian access may be limited during construction of the proposed project. However, as stated earlier, these closures would be limited to weekends and would not exceed a period of one week, and as discussed in Section 1.3, Project Description, the TMP would include minimization and avoidance measures consisting of alternate routes and detours for pedestrians, bicycles, and vehicles during construction activities.

This page intentionally left blank